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No. VIII.

APPARATUS FOR DIVERS.

The SILVER MEDAL was presented to Mr. W. H. THORNTHWAITE, Hoxton, for his Apparatus for the use of Divers ; a Model of which has been placed in the Society's Repository.

SIR, 3 James's Place, Hoxton,
26th May, 1838.

I TAKE the liberty of forwarding with the inclosed description the model of an apparatus, and beg leave to solicit the favour of its being submitted to the Society of Arts.

I am, Sir, &c. &c.

A. AIKIN, Esq.

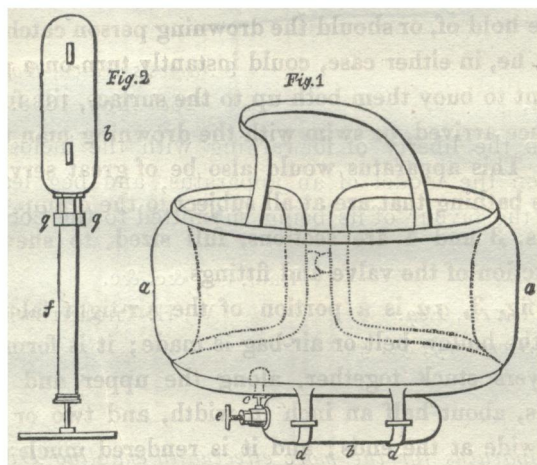
W. H. THORNTHWAITE.

Secretary, &c. &c.

An Apparatus for the more effectually enabling Divers to bring to the surface Weighty Substances, and also of saving Drowning Persons.

The apparatus is of simple construction. It consists of a hollow India-rubber cloth belt *aa*, fig. 1, with a small copper vessel *b* affixed thereto by the strings *dd*, furnished with a valve *a*, connecting tube *c*, and key *e*, into which, by means of the syringe *f*, fig. 2, air may be easily condensed to the extent of thirty or forty atmospheres; the air being thus condensed into a tube one-

thirtieth or one-fortieth part of the size of the rubber belt affixed to it, may be secured round the body of the diver directly beneath the arms, and he will experience little or no difficulty in diving to a considerable depth ; and when the object sought is reached, by one turn of the key of the connecting tube, the rubber belt will instantly become extended with the air previously condensed, and the diver quickly brought to the surface of the water with whatever object he may have seized thereunder.



If the rubber belt contain forty pints of air, it will require a copper vessel of about the size of one pint, and its comparative power would be sufficient to raise a weight of about forty pounds. The copper vessel, when charged, will retain the air without diminution for several months.

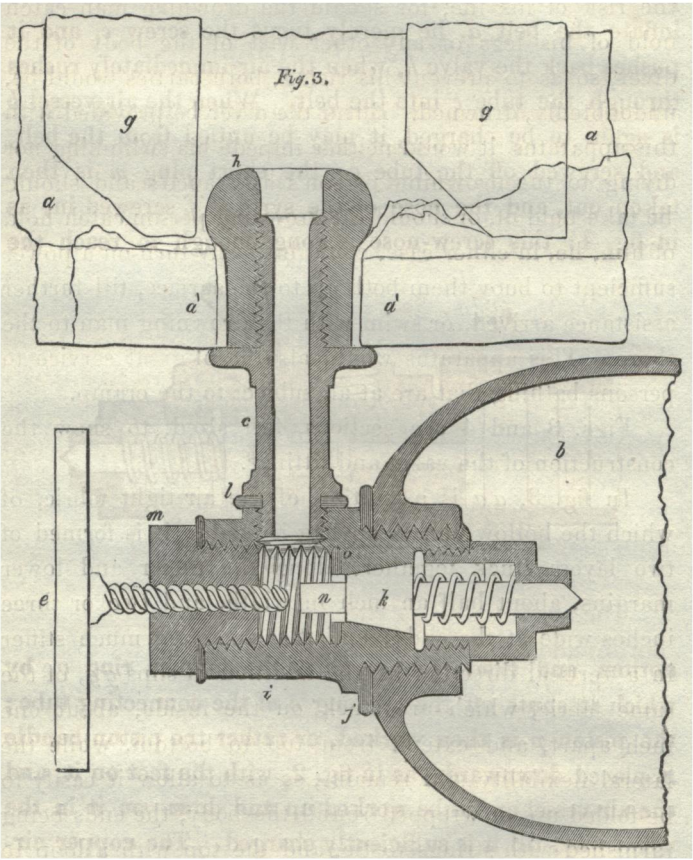
This apparatus has also superior advantages in saving drowning persons to *those now used* by the Royal Humane Society ; *they* being kept constantly extended with air

precludes the possibility of diving, so that, when a person has sunk, they are of no avail, and the drowning person is, consequently, lost; and should a person be venturesome enough to dive after the drowning person, it is at the risk of his life, for should the drowning man catch hold of his legs or any other part of the body of the diver, so as to prevent his rising, both parties would be, undoubtedly, drowned. But if the diver be provided with this apparatus, it would neither impede his swimming nor diving to the drowning person's assistance; and should he take hold of, or should the drowning person catch hold of him, he, in either case, could instantly turn-on a power sufficient to buoy them both up to the surface, till further assistance arrived, or swim with the drowning man to the shore. This apparatus would also be of great service to persons bathing that are at all subject to the cramp.

Figs. 3 and 4 are sections, full sized, to shew the construction of the valve and fittings.

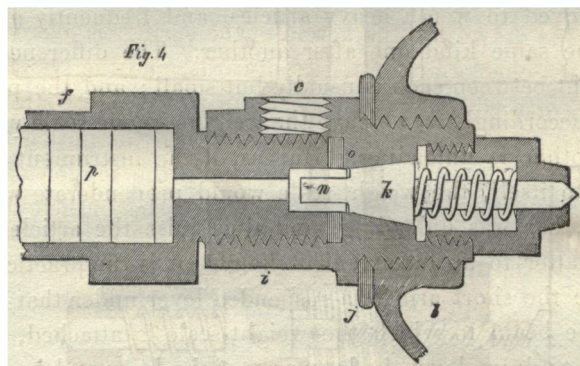
In fig. 3, *aa* is a portion of the air-tight fabric, of which the hollow belt or air-bag is made; it is formed of two layers stuck together, along the upper and lower margins, about half an inch in width, and two or three inches wide at the ends; and it is rendered much stiffer in a vertical direction by the addition of slips *gg*, of the same fabric, which are stuck on the inside, about one inch apart, and extend from top to bottom, while the lateral flexibility still remains, so as to allow it easily to be folded up, or wrapped round the body, the ends being furnished with strings to tie, and the top with a loop to go round the neck. To connect the bag with the copper air-vessel *b*, the tube *c* is screwed and cemented into the round piece of wood *h*, and this is cemented in between the layers of the lower margin, quite air-tight; *a' a'* are

two portions of the front layer; *i* is a plug screwed into the vessel *b*, with a leather collar *j*; it contains the conical steel plug or valve *k*, which is kept closed by the spiral spring at its back in the usual way.



The connecting tube *c* has a screw end and leather collar *l*, to enter the side of the plug *i*; but it being fixed in the bag, the air-vessel *b* and plug *i* are turned round to screw it on to the connecting tube *c*: the vessel *b* is then

tied to the bag, as shewn in fig. 1. Supposing the vessel *b* charged ready for use, the short plug *m* is screwed tight in with a leather collar; it contains the key or triple-threaded screw *e*, whose point is ready to meet the pin *n* of the valve *k*, so that when the diver intends to inflate the belt *a*, he merely turns the screw *e*, and it pushes back the valve *k*, when the air immediately rushes through the tube *c* into the belt. When the air-vessel *b* is again to be charged, it may be untied from the belt, and screwed off the tube *c*; the short plug *m* is then taken out, and the nose of the syringe *f* screwed in, as in fig. 4: this screw-nose is long enough to reach the



bottom and bind tight against the leather ring *o*, by which it shuts off the opening *c* of the connecting tube; the piston *p* is then worked, or rather the piston handle is placed downwards, as in fig. 2, with the feet on it, and the air-vessel and tube worked up and down on it in the usual way, till it is sufficiently charged. The copper air-vessel is here supposed to give sufficient hold, but a pair of handles, like the air-gun syringes, may project from the base at *q q*.